SHOT (Society for the History of Technology)

SHOT: internationalization and the art of translation

Presidential address, SHOT Singapore 2016

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It is a honor and a great pleasure to address you here today in Singapore. This is an important emotional and intellectual anniversary for me: it is 40 years (all but a few weeks) since I first set foot in Singapore on my very first visit to Asia. On 8 September 1976 I stumbled off the plane at Changi Airport into the warm tropical dusk, fragrant with frangipani blossom and woodsmoke. Singapore was a brief stop-over on my way to Kelantan in Malaysia, where I was to spend a year working with rice-farmers on the impact of Green Revolution technologies.[1] Peering out of the taxi as we raced from Changi Airport into town I saw dim lamp-light from the kampongs reflected in the shallow waters of rice-paddies. I was ecstatic: at last I had made it to the rice-growing tropics that I had so long wanted to study at first hand, and in Singapore I would have a chance to explore my first truly Chinese city.[2]

The next morning I had a shock. The headlines on the newstands proclaimed the death of Chairman Mao. China, the civilization I studied, was entering a new era. But that challenge would have to wait: for now I was discovering a delicious new world. I walked through the shop-houses along Jalan Bras Basah and Orchard Road examining bales of batik, tubs overflowing with every possible kind of rice, and state-of-the-art Japanese watches not yet available at home in Britain. I was surrounded by a babel of Tamil, Malay, Hokkien, Cantonese and Hakka conversation, of shop-signs in Chinese characters, Arabic and Tamil script, a polyglot maze that stopped nobody from doing business.

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[1] Publications on this research issue include Bray and Robertson, "Sharecropping", Bray, "Patterns", Bray, Rice Economies, and most recently Bray, "Feeding the nation".

[2] Until 1819 the island of Singapore with its strategically-placed port was part of the Johor Sultanate. In 1819 Thomas Stamford Raffles negotiated a treaty with the Sultan to develop the port as a trading post for the British East India Company; in 1824 a second treaty ceded the entire island of Singapore to British rule. Prior to 1819 the Singapore population was tiny, consisting principally of Malay farmers and a few Chinese merchants and workers. Once the British took over the population swelled rapidly. The Chinese soon formed a majority with immigrants flowing in from Southeast China to work as indentured labourers and often making their homes in Singapore. The British also brought in large numbers of South Indians to work on public construction projects. By 1860 the Malays were a minority on the island.

When British Malaya became independent in 1957, Singapore was the only state on the peninsula which had a Chinese rather than a Malay majority. This created severe tensions, culminating in the political separation of Malaysia and Singapore in 1965. Today over 75% of the Singaporean population is of Chinese ethnicity.

From the very moment of Independence, while recognizing Singapore as a multi-ethnic and multi-cultural community, founding Prime Minister Lee Kwan Yew and his associates insisted upon the importance of Chinese values as the foundation of a distinctively Singaporean social order. The "Chineseness" of Singapore was further enhanced in 1991 when neo-Confucianism was adopted in parliament as the official state ideology and the referent for law-making; see e.g. Li-Ann Thio, "Rule of law"; Kamaludeen and Turner, The Future, ch. 3, "Singapore's 'Soft Authoritarianism' and Population Control".

Singapore was obviously just as modern as Britain, and it obviously had just as interesting and long a history, but I could see at once that Singaporeans "did" modernity, and history, in a completely different way.

What, for instance, did the history of China look like from Singapore? I had studied Chinese language and history for many years, but as I walked among the shophouses, scanned the titles of the Chinese press or pulled out a book from the shelves at ISEAS,[3] I realized that the histories of China I had so far engaged with were all histories written about the centre and from the centre, histories about China as the Central Kingdom, organized by dynasty and authored by scholars based in China itself, in Europe, in Japan or North America. They had done little to prepare me for the realities of the Chinese diaspora, for understanding its ways of being Chinese, its different rhythms and periods, its different challenges and resources, its crucial role in building the trading zones of Southeast Asia, past, present and to come, or its immense importance in shaping the political, economic and cultural history of China. I realized for the first time that just as a knowledge of China was necessary to make sense of Singapore, so too, for a full understanding of modern mainland China I needed to learn from Singapore and its polyglot clamor.[4]

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[3] The Institute of Southeast Asian Studies, established in 1968.

[4] To take an example from relatively recent history, the Singapore chapter of the *Tongmenghui* (Chinese Revolutionary Alliance) played a crucial role in funding the revolts that overthrew the Qing imperial government in 1911, establishing Sun Yat Sen as the first president of the Chinese Republic. Sun had visited Singapore eight times to build support. Today one could point to the vast investments by "overseas Chinese" (*huaqiao*) companies in the PRC, and the special privileges granted to *huaqiao* individuals and companies in return. In terms of contemporary science and technology, 'Singapore and Southeast Asia are far more connected to East and South Asia, scientifically and otherwise, than is commonly realized outside the region' (Clancey et al, "Asian Biopoleis", 4).

The present, however, must be understood in terms of the tissues woven through the region over time. The complex exchanges between China and Nanyang ("the Southern ocean", Southeast Asia) over the centuries include migration out from the Chinese provinces, returns of migrants to China, tributary relations between the Chinese empire and what it was pleased to treat as "vassal" states in Nanyang, often ruled by elites who were part-Chinese, wars, trade, settlements, inter-marriage, the propagation of Chinese orthodoxies and the influx of subversive ideologies. Fitzgerald's pioneering study of the long history of Chinese migrations into Nanyang appeared in 1972 (Fitzgerald, The Southern Expansion). Published six years later, just three years after the fall of Saigon and two years after the death of Mao (many of whose most ardent supporters lived in Southeast Asia as members of Chinese minorities), Woodside's review article "History" was one of the first Western-language studies to call Western Cold War policy-makers and academics on their ignorance about China's past and present role as super-power in the region: 'No interstate relationships in the world – or the controversies they breed in the states that sustain them – seem more unpredictable and paradoxical to Western eyes than the relationships which exist between China and her Southeast Asian neighbors' (Woodside, "History", 215).

Since the end of the Cold War, the historiography of relations between China and Nanyang has taken some interesting new turns. One productive move was to take the seas as the common ground, so to speak. Thus, Indian Ocean studies offers a useful corrective to historiographical chauvinism both Eurocentric and Sinocentric. Reid and Alilunas-Rodgers' subtitle, *Histories of Southeast Asia and the Chinese*, neatly captures the turn away from center-periphery perspectives.

More recently, language and literature scholars, notably Shumei Shi, have proposed the concept of Sinophone as a tool for critical analysis of the interactions between mainstream claims of homogeneity and people on the margins of Chineseness (Shi, "Concept"). Sinophone

The Singapore of forty years ago has of course been transformed. Today it is wealthy, clean, orderly. [5] A new, tidy hegemony of global languages prevails: the untidy buzz of regional Chinese languages has been replaced by two global languages, English and Mandarin Chinese.[6] Singapore today is clean, green and urban, a city-state with boundless technological ambitions and leading scientific institutions.[7] But Singapore is still a cross-roads, a trading-zone, a polyglot, international hub whose success depends upon successful translation:

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studies reject the political and cultural hierarchies implicit in the term "diaspora". They aim to expose the power-laden relations between Mandarin (or modern standard Chinese) and the locally-rooted self-expression and subjectivities of speakers of Cantonese, Hokkien, Teochow or Hakka, all too often dismissed as speaking in dialect and enacting faded or debased versions of the homeland's or political center's culture. In directing attention to the multiple contending linguistic and cultural claims on Sinitic language communities around the world and emphasizing their importance as places of cultural production, the concept of Sinophone offers new approaches to (trans)locality that have so far been applied primarily in the fields of literature and the arts (Shi, Tsai and Bernards, Sinophone Studies) and sexuality studies (Chiang and Heinrich, Queer Sinophone Cultures). The approach would seem to have interesting potential for the history of technology, science and medicine – and it also suggests new ways to think about how language and power are linked in an international society like SHOT.

[5] The Singapore Housing and Development Board offers a vivid example of the Singaporean path to prosperity. Established in 1960, HDB has built and managed the public housing which currently houses over 82 percent of Singaporeans. The policy of providing public housing for all has helped to keep economic differentiation in Singapore (at least for its citizens) at reasonable levels, and in keeping housing costs low has been an important instrument of economic growth.

All the HDB accommodation is high-rise apartments. When I first visited Singapore in 1976, jokes were circulating among the (Chinese) architects at ISEAS about the challenges of allocating space in the new high-rises to the rural families who were being cajoled or forced out of their villages and into urban new towns. The Malays, they said, hated the notion of living in a high-rise and refused to live any higher than the first floor because they couldn't bear not to have an easily accessible garden; the Chinese were happy to move as high as was needed, but angrily resisted regulations that forbade keeping pigs on the balcony. In order to address some of the early challenges of ethnic integration in multi-ethic housing, in the ground-level spaces beneath the buildings HDB opened food-courts (where clients could buy individual dishes from Malay, Indian or Chinese vendors, assemble a complete meal and eat it at the tables set out in the central space between the food-stalls). The ethnic integration policy seems to have worked very well, and today many of these food courts attract connoisseur diners from all over Singapore.

On a visit in 2015 my attention was captured by a new Singaporean variant on "houses as machines for (state-approved) living". The HDB now offers a new "3GEN" model of flat which provides space for grandparents to live with parents and children. The initiative supports recent neo-Confucian legislation making children responsible for looking after parents in their old age, but is – naturally – available to families of all ethnicities. See https://www.ecitizen.gov.sg/Topics/Pages/Housing-schemes-for-multi-generation-families.aspx , consulted 19 October 2016.

[6] Today one is likely to hear a grandfather address his granddaughter in Hokkien while she replies in Mandarin, and may well communicate with her parents in English.

[7] The Singapore government has, for instance, invested heavily to make Singapore a world leader in biomedical research, branding the nation as "the biopolis of Asia". The key point here, as Clancey et al note ("Asian Biopoleis"), is that such initiatives involve much more than a local replication of universal techno-scientific research programs or institutions: they are also explicitly conceived as forms of social innovation, where techno-scientific research informs governance. In social science terms, such initiatives are place-making activities, generating new practices and forms of life that are distinctive to regional or national histories and practices, and thus 'cannot be explained [adequately] with reference to global models or Western examples' (Clancey et al, "Asian Biopoleis", 5).

translation between languages, between cultures, between histories, between regions and between interests.[8]

SHOT too has ambitions as an international hub. For the last few years SHOT has been vigorously pursuing internationalization as a goal in itself, and as a means to diversify. The proportion of non-North American members has increased; we now hold one meeting in three outside North America. Yet SHOT remains a profoundly North American society, more perhaps than many of its members realize. There are significant benefits and significant disadvantages.

This Singapore conference, the first SHOT meeting held in Asia,[9] seems a good occasion to reflect upon internationalization within SHOT: what do we mean by internationalization? what have we achieved, what more can we do and how should we set about it? It is not enough simply to add international members: I argue that SHOT, and indeed any society with international ambitions, also needs to be a good translator if it is to serve as a truly open, egalitarian and productive forum for exchanging views and developing new ideas and initiatives.

I come from a family of professional translators,[10] and as a historian of China I am confronted daily with the challenges of translating between languages, between periods, between fields of scholarship.[11] When I was invited to stand as

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[8] Singapore 'sees itself as unique interregional crossroads and remember[s] itself as a city of immigrants. Regional connectivity is our locality and pan-regional hybridity our daily negotiation' (Clancey et al, "Asian Biopoleis", 5). As a tiny country surrounded by potentially hostile neighbors, Singapore has sought to identify itself as a reliable partner and diplomatic broker in broader regional and transnational organizations. Singapore was a founding member of ASEAN (the Association of Southeast Asian Nations) and hosts the Secretariat of APEC (Asia-Pacific Economic Forum). In 2015 the island state pulled off the diplomatic coup of hosting the first meeting between heads of state of the PRC and Taiwan since 1949.

In terms of technoscience, Singapore is a well-funded, cutting-edge research center in many fields in addition to biomedicine. Urban development is one notable field where research centers based in Singapore are charting new territory, construing urban challenges in distinctively Asian ways. The National University of Singapore, for example, is the base for both the Center for Sustainable Asian Cities and the Future Cities Laboratory (a Singapore-based collaboration between Singapore's National Research Foundation and ETH Zurich). Singapore is noted for infrastructural innovations in water conservation, high-density low-rise housing design, and – perhaps most dramatic – the government's planned expansion of limited urban space by building a second city of malls, research centers and petrochemical plants underground.

[9] This was thanks to the initiative and sustained efforts of Gregory Clancey and his team at Tembusu College, National University of Singapore, with support from a Local Organizing Committee that included scholars from all the main institutes of higher education in Singapore.

[10] My mother, Barbara Bray, was the translator of many works by Marguerite Duras and other avant-garde French writers, and of scholarly works that include *Montaillou* by Emmanuel Leroi-Ladurie. Her sister, my aunt Olive Classe, is the editor of the *Encyclopedia of Literary Translation into English*. I myself have never published a translation as such, but making a draft translation of a voluminous medieval Chinese farming treatise (the *Qimin yaoshu*, Essential techniques for the common people, ca. 535 CE) was an essential part of my apprenticeship in the history of Chinese agriculture.

[11] When I started Chinese studies in 1969 it was expected that even undergraduates would quickly learn to deal competently with literature in classical Chinese, modern Chinese (in its PRC and Taiwanese variants, which used different scripts and page layouts), French, German and occasionally Italian. Post-graduates were also expected to acquire fluency in Japanese (a language which I completely failed to master) in order to work with the cutting-edge sinological scholarship in Japanese.

candidate for SHOT President I had to write a little manifesto. I realized that for me the attraction – which I expressed in my blurb by the more conventional term of internationalization – was to develop SHOT's role as a *translator*: translation here would include interpreting between languages, interpreting between societies, and (in ANT terms) translation as the complicated process of enrolling actors in new and unfamiliar projects, persuading people that new objectives are significant and worth pursuing. In an era of global concern, global scholarship, global action, how can SHOT bring people together and help them to communicate, exchange and build? How can SHOT transcend the limitations of being an Anglophone, American-based society? What are the advantages and resources that SHOT can mobilize to these ends?

I will illustrate my talk with some cases from my own experience pursuing the internationalization of SHOT over the past three or four years.

Why translation?

Earlier this year I was invited to attend a workshop on "Craft and Art in Innovation" in Chennai. The workshop was conceived and organized by Annapurna Madimipudi and Wiebe Bijker as a project for enriching SHOT(which provided a modest subvention as seed-money). First, the workshop aimed to counter a bias that several of SHOT's members have critically remarked upon, namely the bias towards industrial-era technologies, the relative lack of attention to pre- or non-industrial technologies, and the consequent neglect of crafts and skills in our theories. Second, the workshop was not just a meeting of academics: practitioners contributed too. The Chennai meeting brought together Indian weavers, artists and activists, and academics from India, Europe, America. (The workshop was developed into a roundtable and threaded panels for SHOT 2016, and many of the principal participants, including Uzramma, Sushruti and Mohan Rao, are here in Singapore today.)[12] Third, by taking India,

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Beyond the challenges of mastering a grammar and vocabulary, one important point here is that concepts, problematics and modes of argument are quite different in the different scholarly traditions. Our supervisor in modern Chinese, Paul Kratochvil, was a Czech who had worked both in the USSR and in the PRC as an interpreter. Paul, who was well acquainted with the minute subtleties of Marxist-Leninist dialectics, revealed to us the strong influence of the Russian language, through Marxism-Leninism, not only on the vocabulary but also on sentence structures and mode of argumentation that permeated such foundational texts as Mao's "On the correct treatment of contradictions among the people". This was a level of Communist internationalism to which I had not previously been attuned, and it helped me understand some of the difficulties that stood in the way of thorough-going rapprochement between the US and the PRC a few years later.

[12] At the Singapore meeting, in addition to a round-table, *Craft and Art in Innovation, and Innovation in the Arts and Crafts—Exploring New Engagements for the History of Technology*, to which several of the Chennai practitioners and artists contributed, Annapurna and Wiebe, together with Lars Heidi, organized a set of three panels on *Understanding Innovation across Cultures and Technologies*.

These events have laid the groundwork for several further collaborations and projects. The proceedings of the Chennai workshop **will be available online in late November**, and a book proposal is being developed around the workshop conversations that will aim to address Indian policy makers. Mohan Rao, the union leader, has begun efforts to establish a Policy Center for the Handloom, in Chirala (Andhra Pradesh), which would include three SHOT members (Wiebe Bijker, Lars Heide and myself) as advisors. Ineke Sluiter of the University of Leiden, a

not the US or Europe, as context and point of reference, those of us who are not India specialists were impelled to question many comfortably held assumptions about value, power and the unfolding of history.

The Chennai presentations included powerpoints, temple singing, all of us plunging our hands into the indigo vat, Q&A and break-out sessions in Telegu and English. Our discussions were intense, heated though always courteous, and often polyglot. The poor interpreter had a hard job coping with technical terms from crafts, politics, philosophy and social science. To organize our final day of discussion Annapurna and Wiebe requested several of us to provide summaries of thematic debates. We were asked to take on the role not of *rapporteurs* or *discussants*, but of *translators*.

This formulation delighted me. Annapurna's invitation to play the role of UN interpreter, to translate between passionately held and deeply culturally embedded opinions and arguments, between the completely different standpoint of a craft union representative and a historian, or between a historian of India and a historian of China,[13] set me thinking about whether SHOT is a good interpreter, a good translator, as I think all societies with international ambitions should be (but don't always succeed). We already bring together people who speak different languages – different tongues, different expertise, different disciplinary specializations. But can SHOT do more to give effective voice to those who do not speak the dominant languages? Can we do more to facilitate productive dialogue, to help build exchanges that go beyond sitting on the same conference panel? Could we benefit from closer analysis of how language and ideas travel, or fail to travel? Are we sufficiently aware of the very practical barriers that can hamper our best efforts to be inclusive and open?[14]

Translation and the historian of technology's craft

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participant in Chennai, has arranged a visiting fellowship to the Music Department of her university for Sumithra Vasudev, who demonstrated the craft of classical South Indian singing at the Chennai workshop; Uzramma has been invited by Pamela Smith as the keynote speaker at her workshop on "Weaving and Cognition" at Columbia University. Seeing the dense skein of connections that are emerging, I am optimistic that a firm base has been constructed for sustained and productive dialog between the Indian textile activists and SHOT.

[13] Inspired by the discussions in Chennai and the striking contrasts it evoked between attitudes towards "craft" and "technology" in modernizing and contemporary India and China, I have just started working on a little personal project: "The politics of the handloom: craft, technology and the modern nation in China and India".

[14] As John Krige notes, we pay rather too little attention to the barriers to the free flow of knowledge in the global era. 'An interconnected knowledge system is constituted by procedures of inclusion *and exclusion*, it involves flows as well as blockages, circulation and fluidity alongside appropriation and rejection, knowledge sharing and openness alongside knowledge denial and regulation.' Anglophones based in North America or Europe are seldom aware of the full extent of their privilege, their wealth of cultural capital and their freedom to operate compared, for example, to citizens of nations like China whose participation in any supposedly sensitive research in the US or other Western nationas is likely to come under intense scrutiny, control and – commonly -- suspicion; Krige, "Elements".

Translation permeates human activities, and much history of technology focuses on processes of translation between the material, the social and the symbolic: in handloom weaving, for instance, the person who sets up the loom translates the pattern from a mental image or graphic design into the dressing of the warp. Translation is also part of our practice as historians and social scientists, an integral element both of our analysis, and of how we present our research. As historians of technology, we attempt to recover the technological landscapes and technological cultures of the past. In order to make sense of a society's characteristic ideas about the forces mobilized by technological activities of various kinds; about how, whether and to what ends they should or should not be used; the nature of their effects; and their significance, we need to work reflexively and symmetrically, translating the past into terms intelligible in the present while interrogating the present in the light of the past.[15]

The Chennai project on "Craft and Innovation" highlighted this reflexive element. One of the participants was the historian of early-modern crafts, Pamela Smith. In her teaching she addresses the issue of historiography as craft. Her program for history graduates at Columbia includes hands-on training in one or more early-modern crafts. This teaches the students craft skills and sensibilities, opening their minds to a vision of how knowledge is produced that is quite iconoclastic within today's intellectual hierarchies, where the mind outranks (and is thought of as distinct from) the hand. Yet the procedures of scholarly work and output have much in common with the ostensibly separate world of craft-work.[16] Furthermore, the training in crafts teaches young scholars to perceive differently, to valorize resilience, flexibility and coping with failure, to rethink what science is and where and how it happens. Like Uzramma, Mohan Rao and several other contributors to the Chennai project, Pamela sees a huge democratizing potential for integrating craft into broader curricula in schools and higher education, both in a nation like India where the craft sector still employs a significant percentage of the working population, and also in a nation like the US where craft represents very different political and moral values and possibilities.

Nation shall speak unto nation? Anglophone hegemony

What goes on when an essentially Anglophone society like SHOT welcomes participants from China, Taiwan, Brazil, Ghana, or even France? Does it matter that English is not just our lingua franca in SHOT, but the mother-tongue of a large number of its members? How are our thinking and our ways of doing things shaped by the fact that the US university system is the base for the majority of its members? While Americans may worry about losing their role as world economic leader to Japan or to China, their confidence that the US leads

[15] The concept of technological landscape is developed in Lindqvist and Granstand, Changes in the Technological Landscape; that of technological culture in Bijker, "American and Dutch". As an illustration of how both have evolved in what to many will be an unfamiliar context, namely modernizing China, see Bray, "Technology".

[16] Most people still draw a sharp distinction between the work of the mind and the work of the hands; here the students were invited to look at the marriage of mind, hand and body in the crafts of thinking, researching and writing count.

the world as scientific leader remains unshaken, for good reason. The US is both conscious and unconscious of its hegemonic status. It rejoices in heading the world league tables for research and higher education. Its academics are perhaps less aware of other hegemonic expectations: They will come to Us and learn to talk Our language and Our ways; Our questions are good questions in all contexts; We will publish Their good stuff in Our anglophone journals and Our anglophone presses, which not surprisingly head the international rankings because, in a vicious cycle, publications in other languages are less often read and therefore less often cited. Of course there's a degree of creolization, of two-way flow. SHOT has managed to Europeanize very successfully and pretty painlessly.[17] Yet we underestimate the power of Anglophone hegemony at our peril: we need to think always of language as strait-jacket, we need sustained efforts to think outside the English-language barrier.

As Wittgenstein famously wrote, 'The boundaries of my language are the boundaries of my world' (*Die Grenzen meiner Sprache bedeuten die Grenzen meiner Welt*). Our language limits our ways of seeing, our ways of knowing, our ways of relating and of communicating. As historians our particular working set of concepts, theories, interpretive frameworks and good-to-think-with examples is often quite narrowly bounded within the dominant language (English), within our specialist field, period, region, or theoretical position.

Writing in 1973, the Mexican critic Carlos Monsiváis argued that no genuine detective fiction was possible in his country because the nature of crime itself differed from the comfortable homelands of the genre. 'What is exceptional, what is unwonted, is not for a Latin American to be a victim, but that he might cease to be one ... We have no crime fiction here because there is no faith in justice.'[18] In fact a gripping Mexican crime-fiction tradition was perfectly possible, but it turned out to be of quite a different order from Agatha Christie. Latin-American authors and their readers share the view that solving the crime is beside the point: what is unfolded is not the puzzle of whodunnit and the restoration of social order but the mystery of existence and the contingency of survival. Not surprisingly it took a while for this language of crime-fiction to find a readership in English. Now, however, it is the global lingua franca of the genre.

But it is not always easy to persuade people to listen to thoughts in other tongues. Big works in English are readily translated into other languages, but how many foundational works written in Japanese or Chinese, or even (these days) German or French, are translated into English?[19] To influence the world

[17] Yet it is perhaps significant that SHOT's closest bonds are with the Nordic countries, Germany and the Netherlands – the countries where large numbers speak fluent English. Might we even surmise that the predominance in these regions rather than, say, France or Spain, of programmes and research institutions supporting history of technology or STS has somethng to do with their fluency in English and their consequently more easy inclusion in trans-national networks (see Krige, "Elements")?

[18] Quoted in Wood, "Fue el estado".

[19] Anglophone academic presses used to be much more open to commissioning translations of important books than they are today. Their reluctance stands in dramatic contrast to Chinese publishers, for instance, who are actively seeking out English-language titles in fields like history of science, technology and medicine for translation. Two forthcoming readers in HSTM, one of

beyond our national borders we have to write in English. I think here of Benedict Anderson, the renowned scholar of Southeast Asia whose loss we are still freshly mourning. In his best-known book, *Imagined Communities* (1983) and his last, posthumous, publication, *A Life Beyond Boundaries* (2016) Anderson explains how profoundly his own way of thinking was transformed by working with and in Indonesian, a language which he identified for us as a construct of a common identity forged between highly diverse groups united by the goal of independence. (Could we usefully think of "SHOT English" as a similar construct?) Yet even with Anderson's enormous influence and passionate advocacy, how many of us here today could name a single Indonesian writer or scholar who is not well-published in English, let alone name or engage with their arguments? Anderson describes his efforts to broaden the horizons of young anthropologists at Cornell:

> I forced [them] to read Rousseau, political scientists, a nineteenth-century Cuban novel, [and] Maruyama Masao. I picked Maruyama becase he was a political scientist, an Asian/Japanese, and a very intelligent man who read in many fields and had a fine sense of humour and history. It was plain to me that the students had been so professionally trained that they did not really understand [even] each other's scholarly terminology, ideology or theory.[20]

It is always a challenge to understand the logic, to get the point, let alone to appreciate the sophistication of debates formulated in a language we do not know, and in a context that is unfamiliar. With the best of intentions when we Anglophones hear them translated into English we don't react to the alien keywords, we can't pick up on the intertextuality. But SHOT is excellently placed to foster such encounters or engagements. We have so many members for whom these border-crossings are part of everyday life: scholars whose first language is not English, but who have been trained at Cornell or Georgia Tech, who have taught in the US and at home, who publish in English as well as in their native language, and who have to think about how they think in each context.

In addition, SHOT has its International Scholars, people who work and were often trained outside the magic circles of Western Europe and North America. Not all our International Scholars stay in SHOT beyond their 2-year term, but many do, and many work very actively to support the Society and to shape our conversations: they are among our most precious assets. I would like to see SHOT do more to mobilize this extraordinary wealth and breadth of experience as an intellectual tool.[21]

Chinese papers translated into English, the other of English papers translated into Chinese, are the fruit of a joint venture between academic institutions: the HSS, the Institute for the History of Natural Sciences in Beijing and the Max Planck Institute for the History of Science in Berlin. Valuable as these collections will be in broadening readerships, they are not – alas – indicators of any sea-change in the attitude of Anglophone publishing houses towards translating key works in other languages.

[20] Quoted in Sherman, "Benedict Anderson".

[21] This fall the SHOT Executive Council approved a set of proposals from the Internationalization Committee, formulated in consultation with the International Scholars present in Singapore, and designed to give more recognition and focused attention to our International Scholars, past and

Of course I don't mean to imply that SHOT has not already encouraged a number of events or initiatives along these lines. Here I would like to pay warm tribute to the editors of *Technology and Culture*. All of them, and most particularly John Staudenmaier and our current editor, Suzanne Moon, have striven to develop *T&C* as a place of encounters and new conversations, to bring in non-Anglophone voices and offer them a platform to address a world-wide community that they might not be able to reach writing in their own language.[22]

One of my favourite *T&C* exercises in this vein is the occasional essays on the field of history of technology in different countries or language-areas. The latest one, by Natalia Nikiforova, a recent SHOT International Scholar, is entitled "The Concept of Technology and the Russian Cultural Research Tradition".[23] It is not easy to write this kind of survey well, precisely because so much does not translate smoothly: it therefore requires much more discussion and negotiation than normal between author and editor. If *T&C* were to include a short companion piece by the editor and author, brief notes discussing the points of contention or confusions and how they were resolved, I for one would be an eager reader.

As they arise topically, from working in a specific region (technologies in Africa or East Asia, for instance) or period (pre-industrial panels), these issues of difference are raised again and again in SHOT conference panels – can we perhaps do more with them, draw them together to probe even deeper into our "normal science" and to pioneer new positions? SHOT responded with great vigor and success to the challenges of feminism, re-casting the assumptions of the fields of both HoT and feminist theory;[24] our new Special Interest Group, EDITH,[25] is working to incorporate diversity into our modus operandi. I'm not sure that what I am discussing fits exactly under that particular rubric of diversity, but I am convinced that SHOT can and should be more ambitious and proactive in the domain of translation studies – at the very least in co-ordinating and developing initiatives in this vein.

Last year SHOT co-sponsored a workshop at the Centre Koyré in Paris on "Technology Between France and the United States: Encounters and Ignorance".

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present. Volunteering to serve on committees (there is a button on the website!), or agreeing to stand for office, are also effective ways for International Scholars, and indeed international members generally, to make their voices heard.

[22] It is no coincidence, I believe, that both Staudenmaier and Moon have spent their lives working across cultures. Staudenmaier spent his formative years teaching on the Pine Ridge Lakota Reservation in North Dakota and remains deeply involved in the community there (Staudenmaier, "Welcoming"). Moon is a historian of modern Indonesia (Moon, Technology and Ethical Realism).

[23] Nikiforova, "The concept".

[24] WITH (Women in Technology History) was established as a Special Interest Group (SIG) of SHOT in 1976 and celebrated its fortieth anniversary in Singapore with a Presidential Roundtable: "Why Feminist Perspectives on Technology Still Matter—A Global Conversation". Of the many notable feminist works that WITH members have produced in four decades, perhaps the most comprehensive in scope is the reader edited by Lerman, Oldenziel and Mohun, Gender and Technology.

[25] Exploring Diversity in Technology History.

Organized by Guillaume Carnino and Liliane Hilaire-Perez in collaboration with Eric Schatzberg, the catalyst for the meeting was Eric's much-cited paper "Technik Comes to America".[26] SHOT contributors included Liliane and Eric, Adelheid Voskuhl and myself. In addition to some richly suggestive case-studies of how intellectual positions did or did not travel across the Atlantic, the core issue, ardently debated, was how most productively to confront or conjoin the anglophone approach to technology as an object of study, namely a sociotechnical system, with the distinctive francophone tradition of technology as a method of study, the science (or philosophy, or anthropology) of human action mediated by tools (*techniques*). A publication on this critical issue was intended, but has not, as far as I know, proceeded, which is a great pity but not surprising given how busy everybody is.[27]

I can't help feeling that as President of SHOT I could have helped nudge this project further, offering my French colleagues a platform to bring their reflections into conversation with other stimulating examples of translation as power. One obvious example would be the explorations of the forms and impact of Japanese linguistic, intellectual and institutional hegemony that characterized modernizing East Asia. These are currently being explored through the lens of technology by Aleksandra Kobiljski and her colleagues in a series of SHOT-sponsored workshops on 'Technology in Modern East Asia'.[28] The issue of translation and power also ran like a red thread through the presentations and discussions at the STEP (Science and Technology on the European Periphery) conference that I attended in Lisbon in 2014.[29]

Ah yes, the possibilities are tremendous and really tempting. All I (or we in SHOT) need is time, bit-space in the brain, energy and money. But seriously, I would love to hear from you if you have any suggestions about how we could take this further.[30]

Knowledge clusters

[26] Schatzberg, "Technik"; http://koyre.ehess.fr/index.php?1723 consulted 20 October 2016.
[27] Instead the project morphed, at least as far as I was concerned, into a collection of essays offering broader reflections on technological cultures and landscapes, written for students in higher education; Hilaire-Perez, Carnino and Kobiljski, Les mondes et leurs techniques.
[28] Hosted by the Needham Research Institute in Cambridge (UK), this annual workshop is now entering its fourth year. Each year SHOT nominates one of the three or four mentors who work intensively with the six early-career scholars selected from among the applicants to present their work; the Associate Editor or Editor of T&C also attends and advises the presenters on publication strategies.
[29] As Marta Macedo put it in her presentation of STEP at the 2014 SHOT meeting, 'History of technology in the periphery was, until recently, a national history of absences. When confronted with the center, scholars could only recognize that their stories had no relevance for the field.' Founded in 1999 and holding biennial conferences, STEP is a network that seeks to develop new questions and methodologies that challenge and expand the perspectives of mainstream history of science and technology. For STEP's manifesto see http://step2.hicido.uv.es/?q=node/3 (consulted 20 October 2016), and Macedo, "STEP forward".
[30] Thanks to all those who emailed suggestions. They included featuring an occasional series of translations of significant articles in *T&C*; and encouraging more working exchanges between museums of technology and material culture in different countries. We are working on these possibilities!

I flatter myself that one reason why we have so many colleagues here today from China is that last September I visited Beijing. I had a very generous invitation from the organizers of the 4th Forum for Chinese History of Technology. The Forum is held every 2 years in one of China's leading centres for the history of technology; the 2013 meeting was in Hefei, the 2017 meeting will be in Nanjing. In 2015 it was held in the University of Science and Technology Beijing, and Professor Qian Wei (here today) kindly invited me to give a keynote talk introducing SHOT. I was also invited by Professor Zhang Baichun (also here today), the Director of the Institute for the History of Natural Science at Academia Sinica, to give a seminar and to promote SHOT and our Singapore conference. It was partly because I was able to speak face-to-face with Chinese colleagues, and to invite them to contribute not just their presence but their ideas to SHOT's internationalization efforts, that we have such a strong presence of Chinese scholars here today, presenting in panels that cover a wide spectrum of research themes and philosophical reflections. Carl Mitcham and Philip Brown also played a key role here, working with Chinese colleagues to successfully translate the questions and concerns routine in Chinese scholarly circles into projects that speak to a more established SHOT audience.[31]

I don't remember how many scholars attended the 4th Forum in Beijing – a couple of hundred, I believe – but I was impressed in several ways. There were so many young scholars present, bubbling with enthusiasm and ideas. The diversity of perspectives was fascinating, and it was immediately clear that the different disciplines which come together in China to do history of technology are very different from the knowledge clusters in the US or UK. Archaeologists, metallurgists and chemists were conspicuous, working not only on ancient bronzes or the origins of iron-working, but also applying their expertise to questions like how the recent adoption of chemical dyes changed markets and choices of hue and pattern in the brocade industry. There were papers on classical philosophy and technics, on technologies in imperial literature, on future cities and – my personal favorite! – on regal style and changes in the tailoring of robes in the second century BCE. Heritage is now a big topic and source of funding in China, and I'd be most interested to listen in on a meeting between TEMSIG and the Chinese equivalent.[32]

I'd also like to draw attention to the presence here, in significant numbers, of colleagues from *EASTS*.[33] They generously committed to attending SHOT Singapore, holding their editorial meeting here, organizing a panel on "Thinking

[31] Brown and Mitcham co-organized a set of three panels on "Long-Term Impacts of Joseph Needham's *Science and Civilisation in China* on the history of technology" that brought together presenters from China, the US and Korea.

[32] As mentioned above, we are currently working with Johannes-Geert Hagmann of the Technological Museum in Munich towards developing events where such dialogs could take place.

[33] *East Asian Science, Technology and Society: An International Journal*, is the journal of the East Asian STS Network, now entering its tenth year of publication. Several members of the journal's editorial board are also active SHOT members.

with Regions",[34] a big issue for many of us here today, and contributing (among others) to the Presidential Panel on feminist studies today. STS in East Asia is a rather special animal, bringing in more philosophers, anthropologists and historians than is typical in the US or UK. From its very first issue the *EASTS* journal has mobilized local, national and regional Asian cases and histories to interrogate Western STS, to challenge simple East-West binaries, and to develop a critical exploration of the advantages and pitfalls of thinking with region or nation as method.[35]

Welcoming colleagues who are here in SHOT for the first time, whether from East, South or Southeast Asia, from Australia or from anywhere around the world, I would like to encourage you to please consider SHOT as a society that welcomes your ideas, and your suggestions for making your ideas count, and for developing new conversations.

Translation and enrolment

When it comes to presenting our findings and ideas, making them "relevant", we must translate yet again. As our ANT colleagues, including Bruno Latour *ici présent*, have developed the term: successful translation renders a novel, unfamiliar project into terms that convince actors to enrol, to acknowledge the project's usefulness and meaning, to participate in carrying it forward.[36] Such acts of translation can be very challenging. I remember Greg Clancey telling us how difficult it was to "sell" history of technology to Singaporean students and parents. For them technology was all about the future; studying the past of technology was a contradiction in terms.[37]

In my own field of pre-modern Chinese history, many of my Western-based, post-colonially sensitive colleagues find the very term "technology" repellent: they see it as an expression of cultural imperialism, imposing a Western template on the Chinese experience that completely distorts our views of Chinese history. I tell myself ruefully that my row would be easier to hoe if the field of Sinology still operated in French: nobody would deny that imperial China, like every human society, practised *techniques*. In this respect, it was interesting to talk last month to the students taking Pamela Smith's seminar. They found that this introduction to technology as a constellation of skills, techniques, materials, embodiment, perception and collaboration opened up exciting new ways to study history or literature or religion. They had domesticated technology not just for their research, but also for their daily life and making sense of the world around them.[38]

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[34] Wen-Hua Kuo, the incoming editor of the journal, kindly organized the panel "10 Years of EASTS: Thinking with Regions in STS", which included presentations from the perspective of Indonesia, Japan, South Korea, and Taiwan.

[35] E.g. Fu, "How far", Fan, "Doing East Asian STS", Moon and Nappi, "Engaging Asia".

[36] For a fine example of *intéressement* / enrolment through the literal process of translation, see Mitra, "Translation as *techné*".

[37] Clancey, "Dangerous"; this was also a theme in the opening plenary lecture by Dongwon Kim at the 2015 Albuquerque meeting.

[38] Thanks in particular to Sau-yi Fong, Lei Lei and Yuan Yi for giving me their insights after our meeting at Columbia in May 2016.

Doing history of technology is one thing, getting people to pay attention, or to fund it, is another. Here we often come up against more or less sophisticated forms of nationalism.

Most national governments are happy to encourage a certain version of history of technology. They are glad to fund research which can be translated into a triumphalist message for the public, and for the rest of the world: 'we invented this first' or 'we do this best'. As anyone who saw the Opening Ceremony of the Beijing Olympics realized, the "Four Great Inventions" (*si da faming*, paper-making, gunpowder, printing and the compass) are a matter of huge national pride, viewed as fundamental Chinese contributions to world civilization.[39] In this sense the history of their pre-modern technology offers the Chinese consolation for a century of national humiliation between the First Opium War of 1839 and the Revolution of 1949, when Western technologies battered China into defeat and submission.

As our colleagues from China will confirm, a significant amount of research funding for history of technology in China today is allocated on this basis; in Beijing last September a colleague asked me if I had suggestions for the list of Great Chinese Inventions that she had been funded to compile. Her other questions, like those of several other colleagues who asked to interview me during my visit, focused on the so-called "Needham Question" – since China led the world in science and technology for so long, why did it not have its own scientific and industrial revolutions?

When it comes to history of technology and national pride, translation may be tricky indeed! I remember my astonishment, when I moved to France as a twelve-year old, on finding that the translation of "James Watt invented the steam-engine" was "*Denis Papin développa la première machine à vapeur*". Nikola Tesla is claimed as a national hero by Serbia, Hungary and America; according to the website of *Russia Beyond the Headlines*, the 12 Russian inventions that changed the world include the radio, the electrical transformer, the helicopter and TV;[40] living in Scotland, I can state with confidence that in fact it was Scottish engineers who invented everything!

Well actually we no longer make quite such an arrogant claim, but you will not be surprised to learn that when the National Museum of Scotland re-opens its HSTM galleries on 8th July, celebrating its 150th anniversary, Scottish achievements will be to the fore. It's what the Scottish government expects from its National Museum, and it's what the public expects too. This is a Museum that local children love – they pour in at week-ends, eager to gloat over Jackie Stewart's Formula 1 racing car or Dolly the Sheep, two triumphally Scottish achievements.

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[39] See for instance the entry on Baidu, China's most popular search engine, which details the four inventions and includes a section on their world-wide impact; http://baike.baidu.com/item/%E5%9B%9B%E5%A4%A7%E5%8F%91%E6%98%8E/53006#6 consulted 20 October 2016.

[40] See Kuzmin, "Russia's 12 inventions".

It is not so long since the Science and Technology galleries were conceived primarily as a celebration of great Scottish discoveries and great Scottish inventors. Above their hallmark engines, calibrators or television sets hung the heroes' portraits – white, male and bearded. As the twenty-first century dawned the Museum planned a complete overhaul, recasting science and technology as an integral part of everyone's life-chances and experience, acknowledging their role in shaping class, race and gender relations, and mobilizing the technological skills of visitors to greater effect. Digital labels, for instance, can link visitors to a person discussing the relevance of the display to their own life in Scotland today, thus engineering a historiographical shift, from inventor to use. The curators also have plans to make the histories they present more global: for instance tracing machines decommissioned in Scotland as they find new homes in less wealthy nations like Pakistan. They seek to challenge as well as gratify, but as Klaus Staubermann, the Principal Curator of Science and Technology, says, NMS needs its visitors to come back.[41] There are expectations that must be catered to when we translate history of technology to the public.

Finally, I would like briefly to consider another challenge to broadening SHOT's dialogues. Several panels here in Singapore have brought in practitioners. Lisa Onaga and Sierin Lim of Nanyang Technological University here in Singapore organized a *Practitioners' Roundtable: Challenges and Opportunities for Working at the Intersections of Technology, Gender Equality and Youth Empowerment*. I asked them for their thoughts on SHOT and inclusivity. Several questions of translation had come up as they organized the panel: different interpretations of terms, impenetrable thickets of jargon, what does it mean to "invite" someone to SHOT: 'the clarity that emerges when *money* finally enters the picture'. [42] This is a recurrent practical problem: how can SHOT bring in scientists for whom hours are precious, activists who have no access to funding for registration, locals whose Paypal system doesn't work for NGO's (for the Singapore government, SHOT counts as an NGO)? We need to think seriously not just about the vocabulary of communication, but also about the grammatical rules of our organization.

Conclusion

All too often the promise of new dialogue through sharing a table at a conference panel fades away. It offers a glimpse of the exotic and desirable other, flashes of illumination that fade from memory on the plane home. I think SHOT is becoming increasingly effective at helping to turn our meetings of minds from brief encounters to lasting engagements – sponsoring follow-up workshops; hosting Presidential Panels for thinking critically about big issues, creating stronger synergies with sister organizations like the East Asian STS Network or STEP; perhaps soon we shall even co-sponsor some research projects. There is still a way to go, and resources (of time and energy as well as funding) are

[41] Thanks to Klaus Staubermann for allowing me to interview him in April 2016, and my apologies for any distortions.
[42] Lisa Onaga, Sierin Lim, personal communication, 6 June 2016.

limited, but we have such an engaged and dedicated membership that my hopes are strong.

I thank everybody here tonight for coming to SHOT Singapore, and I urge you to to support our efforts to internationalize, to translate, to diversity. Please support SHOT, become long-term active members pledged to make things happen, please make suggestions, please volunteer, please help us to build long-term projects of creative dialogue, critical collaboration, engrossing conversation, mutual enrichment and new ways of looking at technology and the worlds we build with it.